

WIND TURBINE

Instructions



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Model & Parameter List

Our company produces wind turbines from 300w to 20kw, the model and performance parameter as shown in Form 1

Form 1 The Model & Parameter of Wind Turbines

Model	FD200	FD300	FD500	FD1000	FD2000	FD3000	FD5000	FD10000	FD20000
Rated Power(w)	200	300	500	1000	2000	3000	5000	10000	20000
Rated Voltage (v)	28	28	28	48	96	240	280	280	360
Start-up Wind Speed(m/s)	3	3	3	3	3	2	2	2	3
Rated Wind Speed (m/s)	7	8	8	9	9	10	10	10	12
Security Wind Speed(m/s)	35	35	35	35	35	35	35	35	35
Rated Rotating Rate (r/m)	400	400	400	280	280	200	200	160	90
Blade Quantity	3	3	3	3	3	3	3	3	3
Blade Material	glass fiber	glass fiber	glass fiber	glass fiber	glass fiber	glass fiber	glass fiber	glass fiber	glass fiber
Rotor Diameter(m)	2.2	2.3	2.5	2.7	3.2	4.0	6.4	8	10
Tower Structure	60steel pipe	76 steel pipe	89steel pipe	89steel pipe	114 steel pipe	273steel pipe	273 steel pipe	273 steel pipe	325 steel pipe
Tower Height(m)	5.5	6	6	6	9	9	12	12	18
Suggested Capacity	12v120AH 2Pcs	12v150AH 2Pcs	12v200AH 2Pcs	12V200AH 4Pcs	12v150AH 8Pcs	12v200AH 20Pcs	12V300AH 20Pcs	12V400AH 20Pcs	12V400AH 30Pcs

Installation Specification of Guyed Tower

Erection sequence of Guyed Tower

Step 1: Choose the installation site

The wind turbine should be erected as high as possible and far away from the obstructions, so as to get greater speed. At the same time, the soil of the installation site needs to be considered. It is necessary to avoid choosing the soft-sanded or rugged site, or the place vulnerable to the effects of climate change. When selecting the locations, you should also consider the distance between the motor of the wind turbine and the batteries. The shorter the distance is, the shorter the transferring lines will be used. And thus the less the energy is used in the process of transferring. If there must be a longer distance, try to use thicker standard cable.

Step 2: Layout of Tower, Base & Anchor

The relative position of tower, base and anchor (Reference Figure 1)

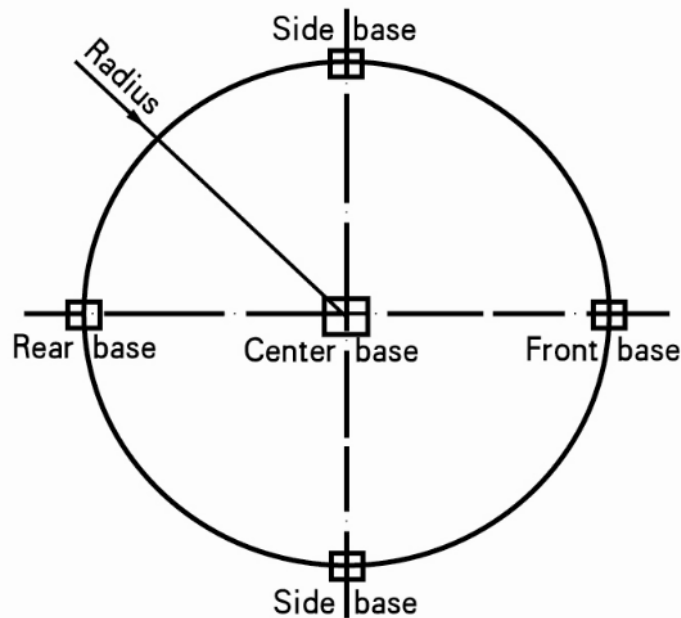


Fig 1 Layout of Concrete Base

The size of tower, base and anchor as shown in Form 2

Form 2 Layout of Tower, Base and Anchor

Model	Radius (m)	Size of centre base(m) long*wide*deep	Size of side base(m) long*wide*deep
200W	2.0	0.4*0.4*0.3	0.3*0.3*0.3
300W	3.0	0.4*0.4*0.3	0.3*0.3*0.3
500W	3.0	0.5*0.5*0.4	0.4*0.4*0.3
1000W	3.0	0.5*0.5*0.4	0.4*0.4*0.3
2000W	4.0	0.6*0.6*0.5	0.5*0.5*0.4
3000W	4.0	0.8*0.8*0.6	0.6*0.6*0.6
5000W	6.0	0.8*0.8*0.6	0.6*0.6*0.6
10000W	6.0	1.0*1.0*1.0	1.0*1.0*1.0
20000W	8.0	1.0*1.0*1.0	1.0*1.0*1.0

For 2Kw & below 2Kw. Pay attention to the following when laying out the base and anchor:

1. Connecting line of two side anchors should be in parallel with the connection of two pinholes on the tail edge.
2. The height of the anchor should be consistent with the height of the tower base.

Therefore, the pulling force between the fixed cable wires can be balanced for the sake of easy adjustment. Otherwise, too tight or too loose fastening pull will lead to the curvature or even breakdown of tower while erecting the tower.

Step3: Pouring base, the anchor base and installation of the tower base.

Diagrammatic sketch of installing the base and the anchor are shown in Figure 2 and 3.

1. In accordance with the last step, dig the pits. The size and the depth of the pits are seen in Form 2.
2. Pouring concrete C25. Put four anchor bolts in the center base. Pay attention to the base hole, the base will be fixed with bolts in the prior pouring cement seat.(as shown in Figure 2)

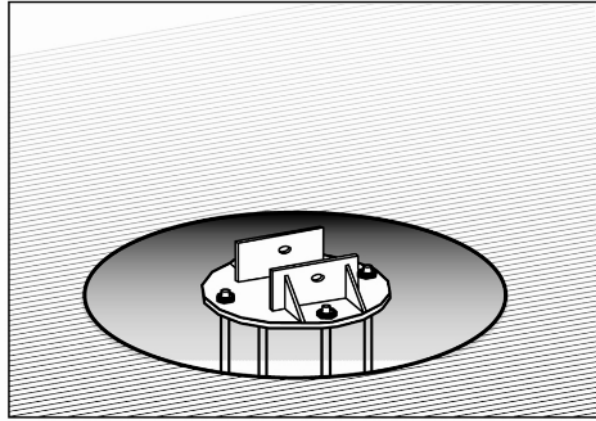


Fig 2 Layout of the Base

3. Located the ring-shaped anchor to the base at an angle of about 60-80, check the distance between the hook ring of every anchor and the base center and anchored around the basic level.(as shown in Figure 3)

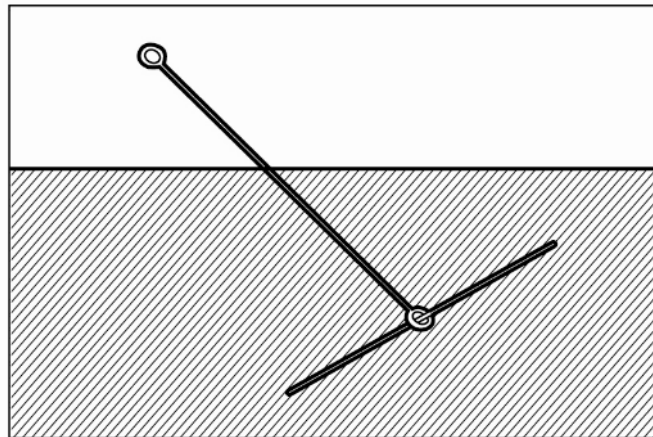


Fig 3 Layout of the Anchor

Step4: Install the tower and wind turbine.

1. Installation of tower:

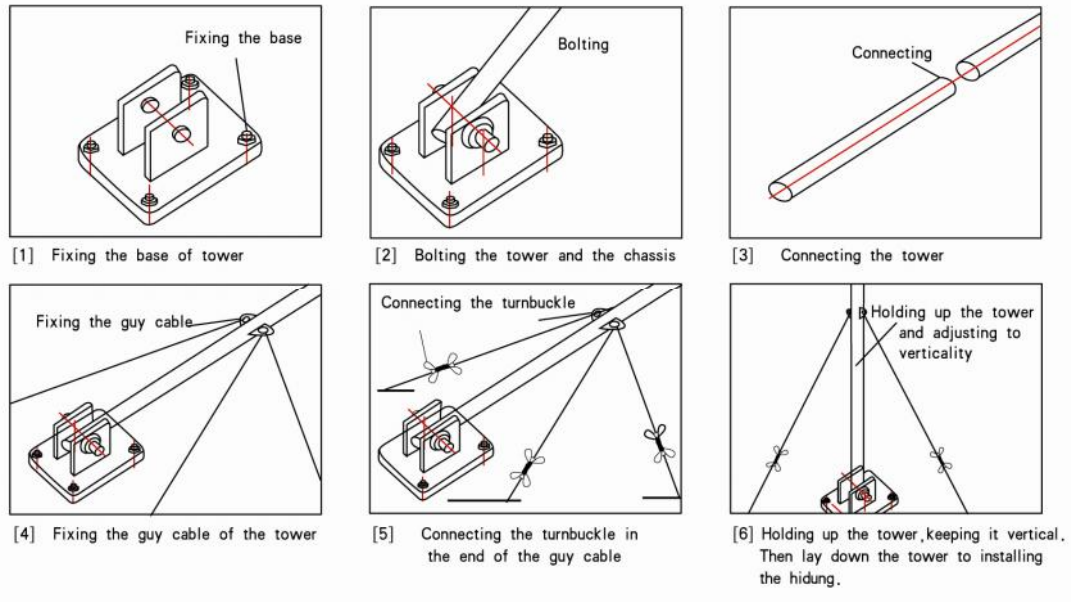


Fig 4 Tower Fixing

2. Installation of complete set of wind turbines:

1. Open-case inspection, check all of the parts with the packing list. If have something wrong, please contact with our company or the dealer.

Installation of wind turbines is shown in the following Figure 5 and Figure 6, but these figures may not in correspond to the outer structure of the real products.

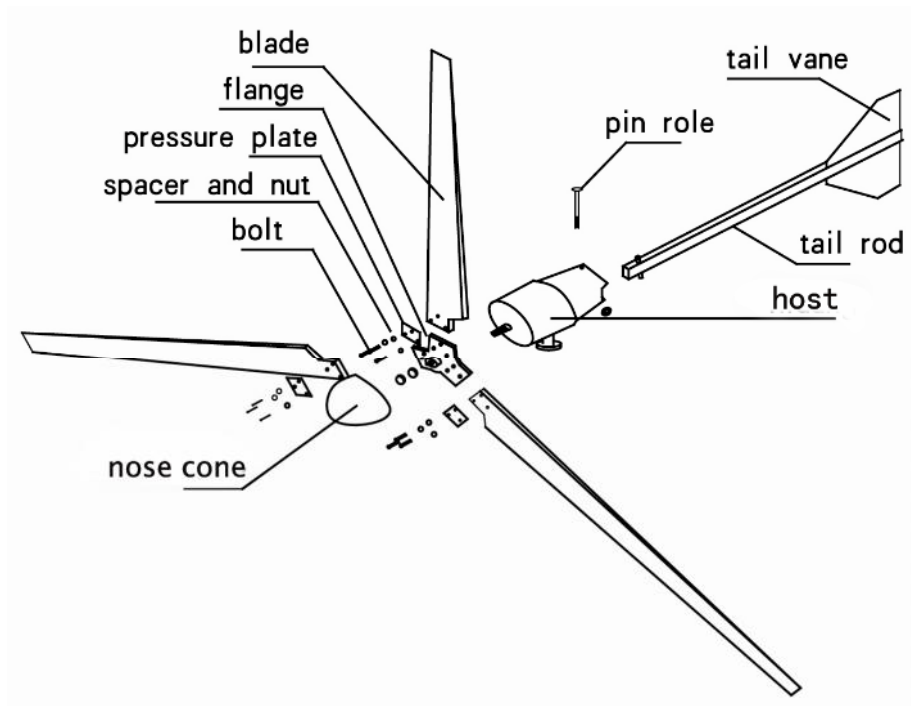


Fig 5 2Kw & below 2Kw

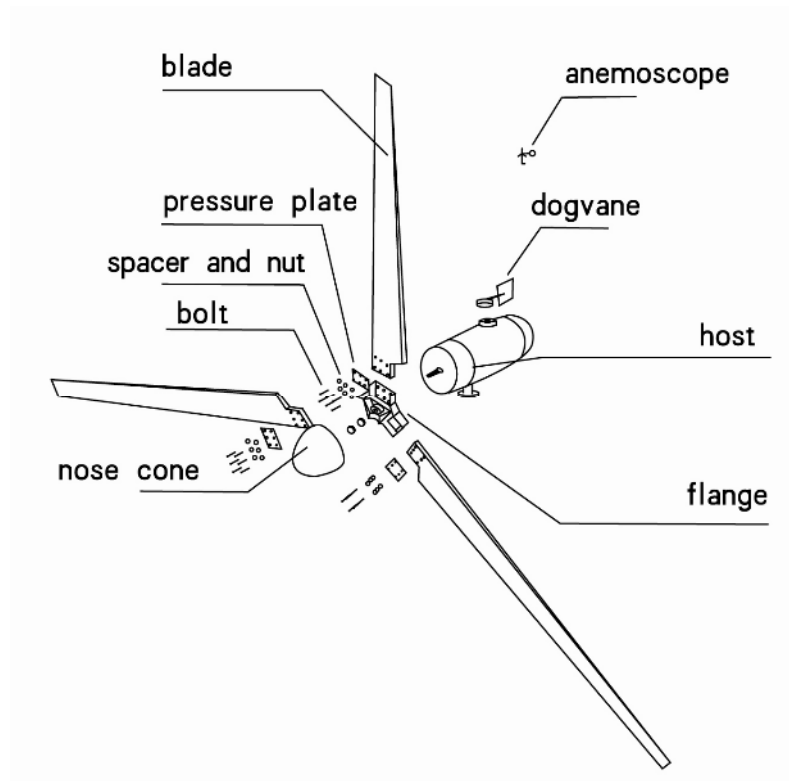


Fig 6 3Kw & above 3Kw

2. Choose desirable triplex cable; connect one end of the cable to the line of wind turbine reliable and insulating.
3. According to the local wind resources, choose the height of the tower in proportion. Put the cable through the tower from the top to the bottom. Connect this cable to the charge controller, not to use the adaptor.
4. Connect the bottom flange of the wind turbine to the top flange of the tower. Install the host in the top of the tower.
5. Fixing the flange in the rotating shaft of the wind turbine, and screw down the nut M27 in the top. Ensure the flange and the rotating shaft fit.
6. Install the three blades to the flange as the specification shows; cover the pressure pad by nine piece of M8 screw. Keep the balance of blades when installing. First, do not screw the bolts too tight; adjust the distance between the tips of two blades after screwing all the bolts.

Installation of blades and flange. (As shown in Figure 7)

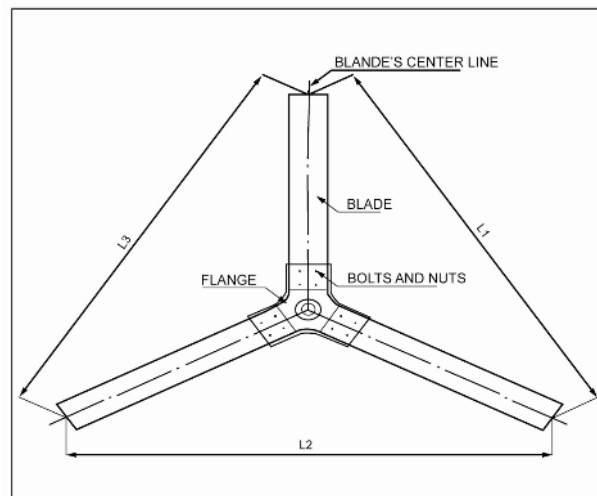


Fig 7 Blade and Flange

Make sure: $L1=L2=L3$ (error allowed: $\pm 5\text{mm}$)

Utilizing spanner for force moment when screwing the bolts of blades and achieving the set force moment (200w、 300w : $15\text{Nm}\pm 1$; 500w、 1Kw、 2Kw : $20\text{Nm}\pm 1$; 3Kw、 5Kw、 10Kw、 20Kw : $50\text{Nm}\pm 1$)

Notice: if you haven't installed them as is mentioned above. We will not be responsible for any possibility of breaking down the blades or flange.

7. After adjusting the equal distance between the blades, screw down the

bolts is sequence (as shown in Figure 8). (300w has three bolts, screw them down one by one).

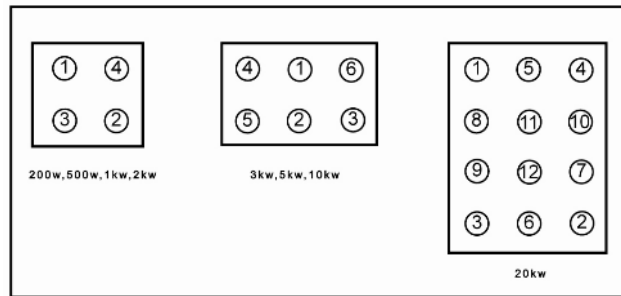


Fig 8 Layout of Blade

8. Fit on the nose cone by the M6 screw and lock it.
9. Install the tail rod see in Figure 8 and tail vane on the host by the M16 screw nut and lock it.
10. Install the charge controller in the safe place and connect them. Please do as the specifications shows.

Step 5: Preparations before erecting the tower

(For 2Kw & below 2Kw wind turbines)

1. Put one end of the four cables through the cable hole (in the top of the montant) and lock with fixture. Except the cable for the farthest anchor, the other three cables need not to lock tightly. Because erecting and adjusting pulling force is necessary before locking.
2. Connect the last fixed wire cable to the one which is at least 16 meters. Tie one end to the winch or tractor.
3. Drill the wire cable or bracing cord through one end of the ladder (2*4 or 2*5) , which will be served as support pole.

(For 3Kw and above 3Kw wind turbines)

1. Fix the fixed cable wire on the tower. The cable wire (both right and left sides) should be directly connected to side anchor through turnbuckle. Cable wire behind should be fixed on back anchor according to the same length. Make sure there is no twist among the three cable wires. The front cable wire will be fixed afterwards.
2. Connecting the two supporting poles.
3. Fix the two relative thin cable wires on the two ears of supporting

pole , and then drill the cable wire before the tower through the two ears , and fix them after putting into the upper pulley.

4. Insert the supporting pole into the tower. The cable wire on the two ears should be fixed on the two side anchors , and then fixed by tighter.

5. First, fix the lower pulley on the front anchor. Fix one end of the longest thin cable wire on the pulley of supporting pole. And make sure the other end drill through the lower pulley , and then drill through the upper and lower pulley. Finally , fix it on a hoist or tractor. (As shown in the Figure 9)

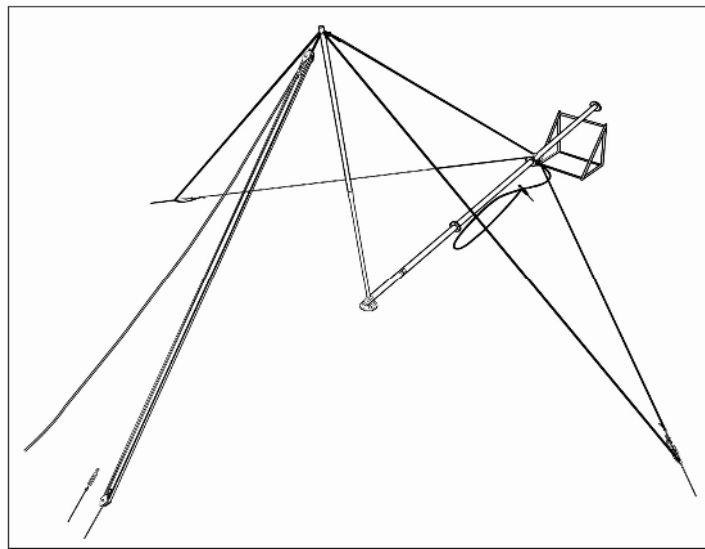


Fig 9 Installation of Guyed Tower

Step 6: Erecting the tower

1. Drive the winch or tractor slowly and the tower will stand up along the moving of the cord. Stop at each rising 15° and check the tensile force of wire cable on both sides. Any over tight or loose wire should be regulated by putting down the tower slowly and adjusting the length of wire cable.

2. Go on pulling the bracing cord until the tower stands up right. Separate the working cord and fix it on its anchor.

3. Check and adjust the strain of each fixed wire cable. Over tight force may bend the tower while over loose force may cause the tower unstable and shakable. The perfect force is neither too loose nor too tight and can be adjusted through circumrotate the bolt.

Installation specification of taper tower

Step 1: Choosing installation sites

Please refer to the installation specification of guyed tower (Step 1)

Step 2: Concrete the base and install of tower

In accordance with the drawings of the base dig the hole, use the flat steel to weld or wind up every anchor by the size, and then put the anchor into the hole and deposit concrete after arraying them. The size of the concrete is C25. Use the vibrating spear to density the concrete. The concrete volume of the tower is about 1.7 cubic meters, 6 cubic meters and 16 cubic meters.

Before installing the tower, pour the reinforced concrete base first, as is shown in Figure 10. The base size of different model is shown in Form 4.

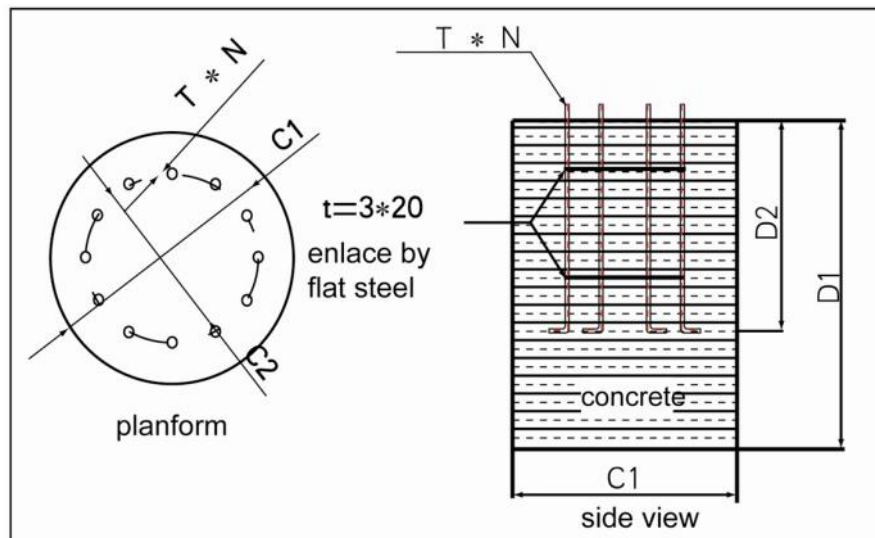


Fig 10 Installation of Taper Tower Base

Form 4 Installation size of Taper Tower Base

Model	Code in Fig 13	1000w	2000w	3000w	5000w	10kw	20kw
The depth of the base(m)	D1	1.2	1.5	1.5	1.6	2.0	3.0
The diameter of the base(m)	C1	1.0	1.0	1.2	1.5	1.8	2.5
The burial depth of the bolt	D2	0.8	1.2	1.2	1.2	1.6	2.0
The layout diameter of bolt	C2	450	600	600	700	1000	1200
The specification of the bolt	T	M18	M18	M20	M24	M24	M30
The quantity of the bolt	N	12	12	12	12	16	16

1. Installation of tower

The taper towers have 3 parts, both ends of each part have flange. According to the diameter size, connect each part by the bolt one by one. (As shown in the Figure 11)

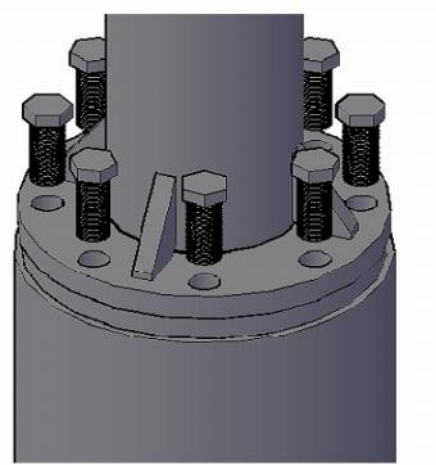


Fig 11 Layout of Taper Tower

The Side elevation of installation as shown in the Figure 12

The Parameter of installation for taper tower as shown in form3

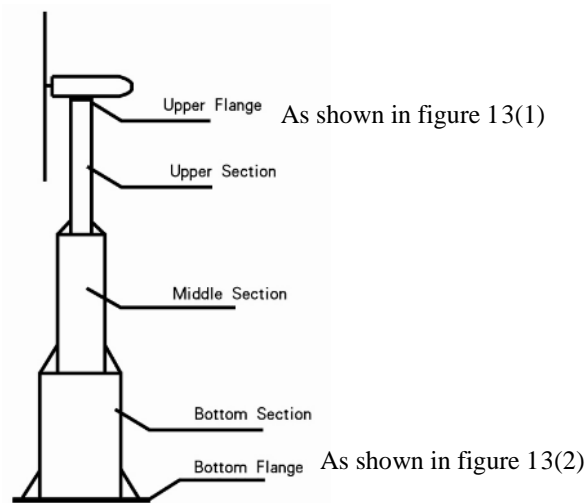


Fig 12 Side elevation of installation

Form 3 Parameter of Installation for Taper Tower

Model	Code No. in Fig. 12	500W-2KW taper tower	3KW-10KW taper tower	20KW taper tower
Height(m)	-	8	12	18
Section No.	-	3	3	3
Upper section parameter	Height(m)	2	4	6
	Diameter(mm)	114	325	425
	Thickness(mm)	4	6	8
Middle section Parameter	Height(m)	3	4	6
	Diameter(mm)	219	480	630
	Thickness(mm)	5	8	8
Bottom section parameter	Height(m)	3	4	6
	Diameter(mm)	325	630	820
	Thickness(mm)	6	8	8
Weight(kg)	-	326	1328	2660
Upper flange (connecting The turbine)	C1(mm)	150	310	500
	C2(mm)	120	200	460
	C3(mm)	90	160	380
	T1(mm)	M12	M16	Φ24
	N1	6	12	16
Bottom flange (fixing the base)	C4(mm)	500	940	1260
	C5(mm)	430	770	1100
	C6(mm)	326	635	820
	T2(mm)	Φ27	Φ40	Φ41
	N2	12	10	16

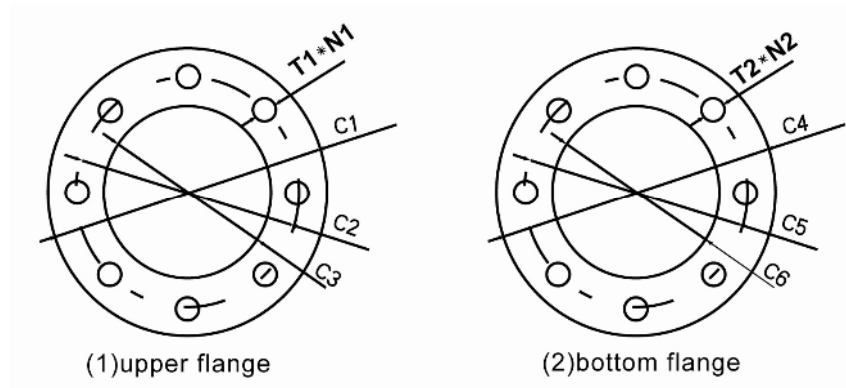


Fig 13 Upper and Bottom Flanges

Put the bottom in the ground, the top in a wooden stand. The height of the wooden stand is about 1-1.5 meters. And install the wind turbine in the top of the tower. (As shown in the Figure 14)

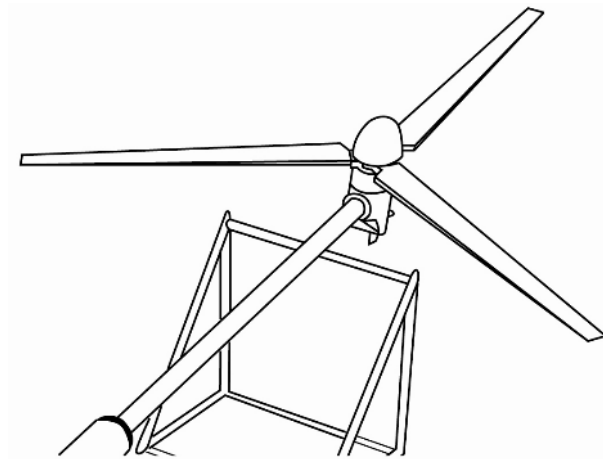


Fig 14 Installation for Wind Turbine

After installation the wind turbine, use the crane to trice the tower and wind turbine by professional. Use hanging strip, instead of wire cable. The hanging strip is tied to the wind turbine, so as to protect the blades. After hanging, adjust the position. Let the flange hole on the bottom aim at the anchor of the base. Then, put the whole anchor into the hole.

Mounting spacers and nuts to tightening, add some butter to antisepsis.

2. Lay down the tower

Be sure to choose a calm weather to lay down the tower, prepare a wooden stand in the same way that you install the tower.

- (1) Disconnect the electrical; make the wind turbine power off (as is shown in wind turbine user manual).
- (2) Use the hanging strip tie up the wind turbine by professional. Drive the crane and make sure that the tower does not fall down after screwing off the anchor bolt.
- (3) Screw off the anchor bolt.
- (4) Drive the crane to trice the tower and wind turbine, to separate them from the anchor.
- (5) Lay down the tower and wind turbine slowly to the wooden stand in a slanting position.

Step 3: Assembly of tower and turbine

Please refer to the installation specification of guyed tower (Step 4) .

Step 4: Hoisting the tower

A hoist is needed while installing the guyed tower , which will be proceeded by professional. Non-working people should be far away from the site when hoisting.

1. Use the hanging strip tied the upper side of pole and hoist slowly.
2. When the tower has been erected , face the open hole on tower base to the cotter bolt and screw down the bolt nut.

Configuration Specification of Batteries

1. Batteries should be placed inside the buildings which should be dry and in constant temperature. After finalizing the quantity of batteries in series, it is necessary to design a wooden stand to put on the batteries, controller and inverter.
2. Connect the batteries in series. The specific way is to connect the anode of the first batteries to cathode of the second one.
3. Make the joints greased. Install the fuse on the positive electrode of batteries. The distance of conducting wire between batteries and controller should be less than 3m.
4. Charge parameter of batteries is shown in Form 5.

Form 5 Parameter of Charging Batteries

Batteries voltage (V)	12	24	48	96	120	240	360
Float charge voltage (V)	15	30	60	120	150	300	450
Overvoltage (V)	15	30	60	120	150	300	450
Over charge resume voltage (V)	14	28	56	104	140	280	420
Under voltage (V)	10.5	21	42	84	105	210	315
Under charge resume voltage (V)	12	24	48	96	120	240	360

Electric Wiring

1. Off-grid Electric Wiring----Off-grid block diagram (Page 29)

To ensure the safety and easy maintenance , please install the switch and fuse according to the diagram. Make sure there are consistency among the output voltages of turbine , batteries voltage and input voltage of inverter. A wire-connecting mistake will lead to burn down the turbine , batteries and inverter.

(Special attention to 3kw & above 3kw)

a. There are two cables elicited from the turbine head. One is the cable of wind direction, wind speed, unbitten signal with aviation plug on cable head. You need to insert it into the socket. The other cable is for the output of turbine power and yawing turbine. There are five lines. Three of them are relative thick for turbine output. The other two relative thin for yawing turbine , which is classified as positive electrode and negative one. All of these should be connected to the connecting interface at the back of controller accordingly.

b. Controller specification----Controller Principle (Page 22)

2. On-grid electric wiring

All the modes can be applied to on-grid environment. But it is approved by local regulations. What is more , on-grid controller and inverter need to be purchased additionally.

Maintenance

Wind turbine may be operated under extremely harsh environment , or meet various complicated weather. Therefore , regular examination and maintenance are needed in order to keep the system operate rightly.

Safeguard Steps:

1. Check the cable wire if it is too loose or too tight. And if it is, adjust them, in particular in initial stage of installation and post-gale.
2. Check whether or not the wire is damaged or loose. And whether the joints are loose and rusted or not in order to secure electrical safety.
3. For the batteries, keep the height of electrolyte. If it is lower, add it in time. The specific way is shown in the batteries manual.
4. Before storm, it is better to lay down the tower for escaping from unpredictable loss.

Notice: do the inspection every three months

Maintenance:

1. When maintaining the wind turbines, check them as the following procedures.
 - a. examine whether the transmission cable is connected or not.
 - b. Measure the resistance of the slip ring and the crust; it must be no less than $0.5K \Omega$;
 - c. Measure the three-phase of wind turbine is connected or not.
 - d. Measure the resistance of the wind turbine cable, the standard value as shown in Form 6.

Form 6 Standard Value of Three-Phase

Model	Inter phase Resistance	Slip ring Resistance
300W	2.42Ω	6.3Ω
500W	2.38Ω	6.3Ω
1000W	2.5Ω	9.8Ω
2000W	3Ω	11.6Ω
3000W	3.9Ω	
5000W	3.7Ω	
10KW	2.5Ω	
20KW	2.48Ω	

2. Measure the three-phase is isolated from the ground before laying down it.
3. Prepare a wooden tripod and power dump before lay ing down the wind turbine. The way of laying down is the same as installing, but the sequence is just opposite.
4. First, loose a steel wire cable. People can not stand opposite to the line. If it's windy, lay down it to the tripod in tail wind direction.
5.
 - a. Tear down the tail rod and tail vane, open M16 nut to unload them.
 - b. Tear down the nose cone, then the 9 pieces of M10 bolts, to take down the blades.
 - c. Tear down the M27 nut and the flange, don't lose anything.
6.
 - a. Use 6mm interior angle spanner to tear down the 8 pieces of M8 interior angle bolts in the front of the wind turbine. Then, tear down the full turn shell. (Don't pull it too strong; in order to avoid pulling cut the line inside.)
 - b. Use the spanner to tear down the line of electric brush.
7. If the resistance of the slip ring is not enough, take off i t and change a new one.
 - a. First tear down the rubber cover.
 - b. Use the washer on shaft pliers to tear down the washer on shaft in the bearing. Then, tear down the rotating shaft. (Don't roughening the shaft.)
 - c. Screw off M8 nut near the waterproof and dustproof cover. Tear down the electric brush rocker.
 - d. After that, tear down the slip ring location screw, change the slip ring. Electric brush slip ring installation as shown in Figure 15:

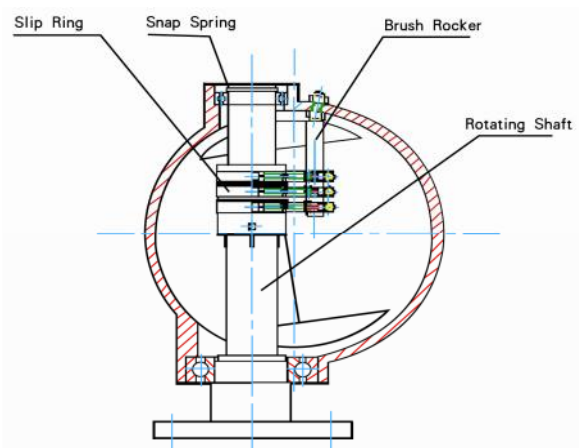


Fig 15 Installation for Slip Ring

FAQS

Why does not my electro-equipment work after connected to inverter?

Check the dump energy. If the energy is not enough , the system will not operate normally; if the energy is enough, please check the connecting wire between batteries and inverter is correct.

Why can not the batteries be charged?

Check whether the rotor is rolling or not , the turbine has no output at too high or too low wind speed. If the rotor is normal, connect the turbine's wire from batteries and controller in right way. If the voltage is normal, please check the batteries are break or not. If the voltage is zero, check the wire of turbine.

Why does the rotor can't roll at a normal wind speed?

If the output wire of turbine is short, the rotor will not roll. Check the turbine's wire after disconnected from batteries. At the same time, check carefully whether the rotor is installed in a right way.

How to lay down the turbine?

(For 3KW & above 3KW)

1. Firstly, stop the turbine. Set control "hand" and "auto" to "hand". and then hold on the "reverse" or "turn" to make the turbine turn a 90 angle with wind direction.
2. After the blades stop rolling, shortcut three line of turbine.
3. Press the "reverse" or "turn" key to make the turbine's end face to the direction of putting down. Ensure the rotors are not damaged by putting down the generator with its rotors up.
4. Put down the turbine in the reverse steps of installation.

(For 2KW & below 2KW)

1. Disconnect the turbine and controller. Make the three output lines be short circuit to prevent the blades from further running.
2. Put down the turbine in the reverse steps of installation.

Can I enlarge the batteries' capability to lengthen the available time for electrical appliance?

Enlarge the capability of batteries would make the batteries on half full state and can not shorten it lifespan.

What if the wind turbines (3kw & above 3kw) can not trace wind direction automatically?

1. Check whether the anemoscope is broken or not. The concrete way is to examine whether there is wind-speed indicator on controller;

2. Check whether the dogvane is broken or not. The concrete way is to unplug the plug of dogvane from controller, and you will see there are three line on dogvane with marks --- 、 --- 、 --- . Measure the resistance between --- and --- by multi meter, the resistance should be appropriately 1000 Ω , and then measure the resistance between --- and --- , along with --- and --- . The resistance figure of these two (--- and --- + --- and ---) should be equal to the resistance figure between --- and --- .

3. If no problem exist the ahead two procedures, check whether the controller board has been set on “auto”. Otherwise, it can not trace the wind direction automatically. If it can not trace the wind direction, the reason causing this is mostly for low wind speed. Only when the wind speed is larger than 3m/s staying more than 30seconds, can you trace wind speed and change windward angle.

How long is the turbine's lifespan ?

It's 15 years under normal care.

If you have any other questions, please contact us by phone or E-mail.

ZLFD-II Wind Turbine Controller Principle

This series 3KW----20KW wind turbine controllers are full automaticity intelligent controllers. Adopt by the microcomputer chip and many kinds of sensor (include anemoscope, dogvane, host displacement pickup, revolution transmitter and so on) to protect the wind turbines and batteries. It's one of the most advanced and intelligentized controllers at the present time. The exterior of controller is shown in Figure 16.

These controllers were run in the Red bay test site in Shanwei by institute of Oceanology, Academia Sinica in Guangzhou one year. Everything has been in accordance with the design, since the last year and run normally. The secretary-general of CWEA Li Defu inspect to Nantong, after actual motion, he highly appreciate the function and the idea of these controller.



Fig 16 Exterior of Controller

Main feature:

1. Signal transmission is stable. The signal of wind direction, wind speed and accommodation (cast loose) adopt the communications interface 485. Use one cable to parallel connection transmission.
2. The detections of rotate speed, temperature and electric current are completed in the controllers, to lessen the transmission cable.
3. Can reset the parameter. The controllers can deliver debugging. Based on the local wind regime, alter the parameter at any time.
4. To keep the wind turbine running smoothly, use treble protection----the yawing, brake and unload. Combining active protection with passive protection makes them more reliable.
5. Can automatic cast loose, ensure the cable can not intertwine and break.
6. The wide voltage input switch power supply, up to 1000V, can guarantee controller main control panel and the yawing motor operate safely under the high voltage.
7. Can telecommunications by the communications interface 485 of main computer controllers. Transport 52 common data of the controllers to the upper computer by MODUBOS agreement. Telecontrol the controller after install relevant software.

Main Panel Wiring Manual

Main panel wiring is shown in Figure 17.

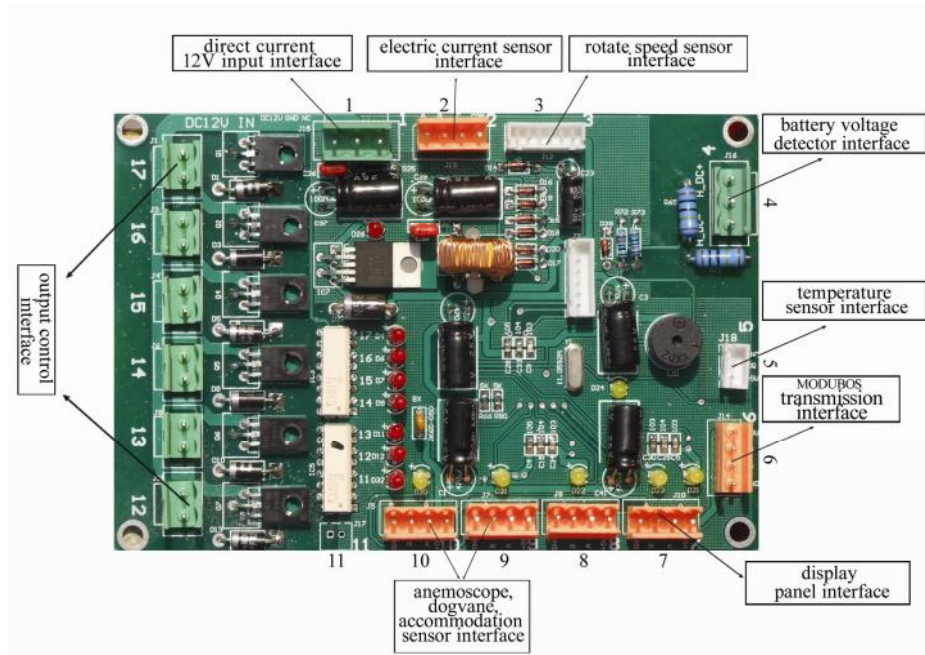


Fig 17 Main Panel Wiring

Interface:

1. DC12V input, plug① +12 V, plug② 0V, and plug③ empty
2. Connect current transducer board, plug① A, plug② B, plug③ C, and plug④ common port
3. Connect speed sensor, plug① +5, plug⑤ sign, and plug⑥ ground
4. Batteries voltage input, plug① batteries+, plug② batteries-
5. Connect temperature sensor DS18B20
6. MODBUSRTU transmission interface, plug ① 5V, plug② A, plug③ B, plug④ ground
7. Connect display control panel, plug① 5V, plug② A, plug③ B, plug④ ground
- 8, 9, 10. wind speed, wind direction and host sensor
11. Reserve
12. Brake signal interface
13. Unload fan interface
14. Rectifier heat output fan interface
15. Unload relay interface
16. opposite direction yawing relay interface
17. Positive direction yawing relay interface

Controller manual

Controller is the bridge of batteries, electrical equipment and wind turbine. Not only protect wind turbine to run safely, but also protect the batteries against overcharge and overdischarge. It's one of the most important parts of wind generating system.

1. Key assignment explanation as shown in Figure 18,19:

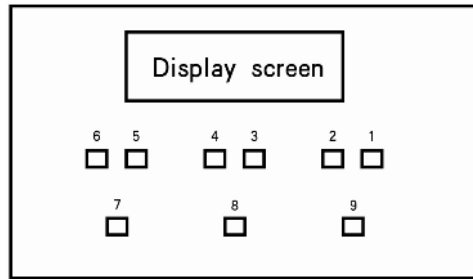


Fig 18 Block diagram



Fig 19 Real Diagram

- (1) Key 6 and 5 function as cut over interface
- (2) Key 4 and 3 function as Chinese and English transform
- (3) Key 2 and 1 function as adjustment: Press 2 at the “hand” mode, the yawing motor clockwise minitrim. Press 2 long time, the adjustment continued. Press 1, the yawing motor anticlockwise minitrim. Press 1 long time, the adjustment continued. Other frames will adjust other value.
- (4) Key 8 can change the “hand” and the “auto”. Press 8 long time over 3 seconds, work mode can change between “hand” and “auto”. At the “hand” mode, the light above key 8 will twinkle. The third line of LCD screen will show “manual, be careful”
- (5) Key 9 is the shut down key: At “hand” mode, turn on hand shut down to load off. Press it long time to cancel the alarm in the main board. At the “auto”, the motor can yaw 90° to face the wind automatic. According to the batteries to state to control unload.
- (6) Key 7 is the turn on key: At the “hand” mode, press it to cancel unload. Open the alarm sound in the main board.
- (7) Access to the factory reset(need professional, and change it after asking the password from the factory)press the key 5 or 6 above 3 seconds, the machine will request to enter the password: key 4 is number1, key 3 is number 2, key 2 is number 3, key 1 is number1

- ① Aid telephone: 13773769552
- ② Batteries nominal voltage, regulate parameter, 240V
- ③ Current modulus, regulate parameter, 42
- ④ Voltage modulus, regulate parameter, 98
- ⑤ Face the wind time lag (as the time lag of the turbine follow the wind, regulate parameter, 10
- ⑥ Stop the unload time lag, 10
- ⑦ Angular distance modulus, 24
- ⑧ “MODBUS ID” is used for set the motor in the modbus website , 000
- ⑨ For virtual sensor, 001 (have no sensor is 000)
- ⑩ Integral adjust modulus, 100
- ⑪ Proportion adjust modulus, 15

The above are the number of factory reset. Don't amend it in normal. Adjust it at random will lead to the controller chaos, the number to show is forbid, to avoid the wind turbine and controller malfunction.

2.Aid:

In the aid mode, can press 2 and 1 to refer to related things. 1. Power in time. 2. Accumulated electrical energy. 3. Rotated speed. 4. The temperature of controller and host. 5. The communications quality of the main board. 6. The communications quality of the wind speed panel. 7. The communications of the wind direction panel. 8. The communication quality of the host direction panel. (the communications quality of the main board, wind speed, wind direction and the host direction. If the number is large, the communications must have mistake. The theory number is 000).

3. Display screen show:

Batteries voltage, charge current, yawing angle, unbitten angle, machine needed yawing angle, wind speed in time, rotate speed in time, power in time, batteries opposition or exception, hand mode, unbitten exception, positive and opposite direction of over pressure unload and so on.

4. Sensor connects:

The three lines of the host displacement sensor can through the plug,

connect to the three-core interface in breadboard of the dogvane.

The wind direction and the transmission line of the host RS485 can connect to the parallel connection socket RS485 of wind direction.

Put the transport signal line RS485 of anemoscope to connect with the quadripuntal plug (the connect way: plug 5V, plug A, plug B, plug ground), through the cable to the either faucet 8, 9 or 10 of main controller.

Dogvane and anemoscope are shown in Figure 20.

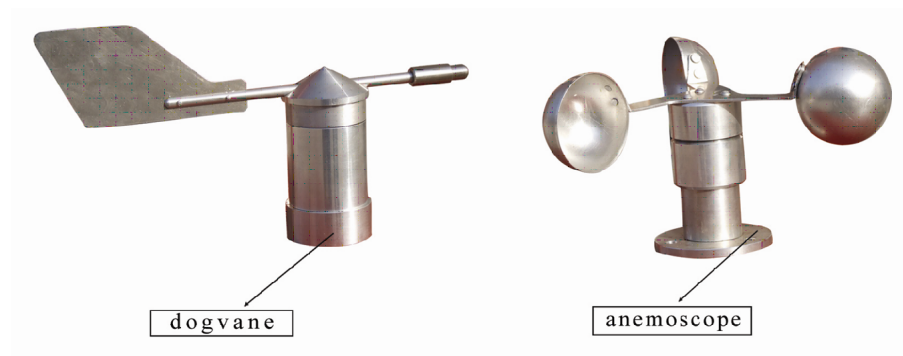


Fig 20 Dogvane and Anemoscope

5. Working principle of controller:

When connecting the wind turbine to the controller, please do as the following shown in Figure 21.

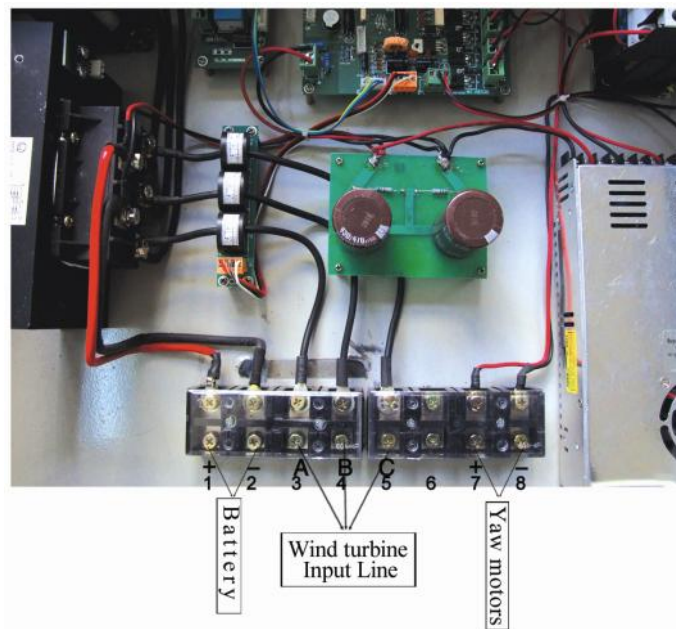


Fig 21 Connection of Wind turbine, Batteries, Yawing motor and Controller

(1) Connect the anode and cathode to the interface 1, 2 of the controllers. Connect the three transmission line of the wind turbine to the interface 3, 4, 5 of the controller. Connect the yawing motor to the interface for yawing motor +, -. Connect sensor RS485 to the interface 8, 9 or 10 of main board. Check it before working.

When the motor is running, the control panel must be in the state of “auto”, “startup”. When the wind speed is over 3m/s, the host can be facing the wind automatically. (If in the “hand”, the host can not facing the wind automatically, can press the key 2 and 1)

Show the batteries voltage, charge current, wind speed in time, yaw angle, host direction, host temperature, rotate speed in time and so on.

(2) The controllers running in set order, the wind turbines, batteries and electric equipments can be running in optimum state.

When the voltage is over the set value (290V——300V), the controller can unload automatic and the wind turbine yawing 30°. When the voltage is below the revert point (270V——280V), relieve the unload and go on to charge the batteries.

When the charge current is over than 35A, for protect the batteries, unload automatically. Yawing 30°, 60° or 90°. The change angle is based on the charging current.

When the wind speed is over 10m/s, yawing angle is 30°

When the wind speed is over 12m/s, yawing angle is 60°

When the wind speed is over 15m/s, yawing angle is 90°

When the wind speed is over 18m/s, yawing angle is 90°, unload &brake.

When the wind speed is below 3m/s, the system will stop. When the wind speed is over 3m/s, the system is working. (The power of the wind turbine is count and totting-up by the media server.)

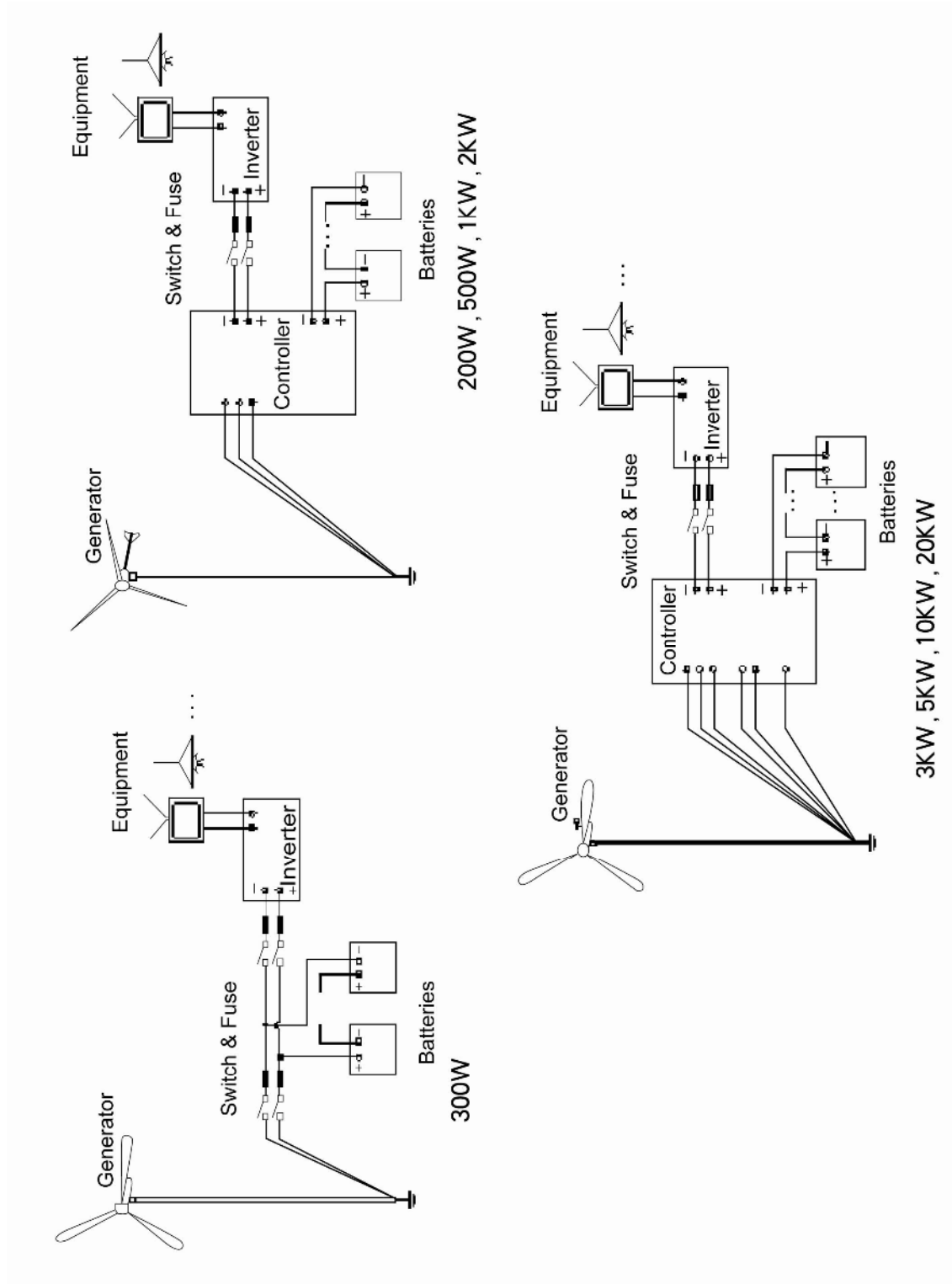
6. MODBUSRTU transmission definitions:

The controller can send the signal by RS485 transmission mode. After confirming the web station number, transmit by MODSRTU consultative. The definition of data transmission is shown in From 7.

Form 7 The definition of Data Transmission

Input Line	No.	
1	0001	Wind speed×10
2	0002	Biased toward
3	0003	Electric current×10
4	0004	Rotate speed
5	0005	No process biased toward×10
6	0006	voltage×10
7	0007	Motor direction absolutely
8	0008	Require angle of deviation
9	0009	Rectifier temperature
10	000a	Host angle target
11	000b	Wind speed communications quality
12	000c	Wind direction communications quality
13	000d	motor direction communications quality
14	000e	display communications quality
15	000f	show alarming
16	00010	alarming noise continue
27	00011	the count down of positive direction yawing
28	00012	the count down of opposite direction yawing
19	00013	virtual regulation resistance
20	00014	integral angle error
21	00015	face the wind delay
22	00016	face the wind delay 2
23	00017	face the wind delay 3
24	00018	face the wind delay 4
25	000d	wind speed edition number
26	000e	the wind direction main board number
27	000f	motor direction main board number
28	00020	wind speed opto-electrical power level in time
29	00021	wind speed opto-electrical power level in time
30	00022	wind speed opto-electrical export in time X X D107 D106 D105 D104 D103 D102
31	00023	wind speed opto-electrical D102 power level in time
32	00024	wind speed opto-electrical D103 power level in time
33	00025	wind speed opto-electrical D104 power level in time
34	00026	wind speed opto-electrical D105power level in time
35	00027	wind speed opto-electrical D106 power level in time
36	00028	wind speed opto-electrical D107power level in time
37	00031	the version number of main board
38	00032	=0 hand >0 auto
39	00033	=0 on =0 off ==0xa5 start unload
40	00034	
41	00035	batteries nominal voltage /2
42	00036	electric current modulus
43	00037	voltage modulus
44	00038	face the wind delay
45	00039	stop unload delay
46	0003a	angular distance modulus
47	0003b	ModBus ID
48	0003c	=0 Non cast loose potentiometer, >0 Cast loose potentiometer
49	0003d	integral adjust modulus
50	0003e	pro rata to adjust the angle
51	0003f	=0 Chinese(汉) =1English(En)
52	00040	

Off-grid electric wiring



* The dateline of this manual is December 2008. Specifications are subject to change without notice for further improvement. Please forgive.

* The guarantee of turbine and controller is 2 years , and the inverter is 6 months from the date of purchasing (non-done by man or majeure).